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# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference XA1579			FOR FURTHER ACTION  See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)			
International PCT/GB			International filing date (12.11.2003	(day/month/year)	Priority date (day/month/year) 20.11.2002	
Internations			hoth national classifice**-			
Applicant BAE SYS	STEM	S PLC et al.	-	·.e		
1. This	interr	national preliminary ex and is transmitted to th	amination report has bee e applicant according to	en prepared by this Article 36.	International Preliminary Examining	
2. This	REP	ORT consists of a tota	of 6 sheets, including t	his cover sheet.		
	beer	n amended and are the	anied by ANNEXES, i.e. e basis for this report and on 607 of the Administra	d/or sheets containi	ription, claims and/or drawings which ha ng rectifications made before this Author der the PCT).	
The	•	nexes consist of a tota			•	
≁3⊁ This	s repo	rt contains indications  Basis of the opinion	relating to the following i	tems: . · c year	· · · · · · · · · · · · · · · · · · ·	
11		Priority				
Ш	$\boxtimes$		·	novelty, inventive s	tep and industrial applicability	
IV		Lack of unity of inve				
V	⊠	Reasoned statement citations and explan	t under Rule 66.2(a)(ii) w ations supporting such si	vith regard to novel tatement	ty, inventive step or industrial applicability	
VI		Certain documents	cited			
VII   Certain defects in the international application						
ŢŢŢ	ļ <b>□</b> .	Çerţain observation	s on the international app	olication .	· · · · · · · · · · · · · · · · · · ·	
Date of su	bmissi	on of the demand		Date of completion	n of this report	
13.05.2004				23.08.2004		
Name and mailing address of the international preliminary examining authority:				Authorized Officer	- Suchan Palan	
European Patent Office D-80298 Munich				Springer, O	· · · · · · · · · · · · · · · · · · ·	
<b>)</b>	Τe	I. +49 89 2399 - 0 Tx: 52	3656 epmu d			
	– Fa	x: +49 89 2399 - 4465		Telephone No. +4	9 89 2399-2619	

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/GB 03/04895

I. Basis of the	re	po	rt
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1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)):

	Description, Pages					
	1-10	0	as originally filed			
Claims, Numbers						
1-4			as originally filed			
	1-4		as originally filed			
	Dra	wings, Sheets				
	1/3-	3/3	as originally filed			
2.	<ol> <li>With regard to the language, all the elements marked above were available or furnished to this Authority language in which the international application was filed, unless otherwise indicated under this item.</li> </ol>					
	The	ese elements were av	ailable or furnished to this Authority in the following language: , which is:			
		the language of a tra	anslation furnished for the purposes of the international search (under Rule 23.1(b)).			
		the language of pub	lication of the international application (under Rule 48.3(b)).			
		the language of a tra Rule 55.2 and/or 55.	anslation furnished for the purposes of international preliminary examination (under 3).			
3.	Witl inte	h regard to any <b>nucl</b> e rnational preliminary	eotide and/or amino acid sequence disclosed in the international application, the examination was carried out on the basis of the sequence listing:			
		contained in the inte	rnational application in written form.			
		filed together with th	e international application in computer readable form.			
		furnished subsequer	ntly to this Authority in written form.			
	☐ furnished subsequently to this Authority in computer readable form.					
		The statement that t in the international a	the subsequently furnished written sequence listing does not go beyond the disclosure application as filed has been furnished.			
		The statement that t listing has been furn	he information recorded in computer readable form is identical to the written sequence ished.			
4. The amendments have resulted in the cancellation of:						
		the description,	pages:			
		the claims,	Nos.:			
		the drawings,	sheets:			

. ....

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/GB 03/04895

5.		This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).						
		(Any replacement sheet conta report.)	aining	such amendi	ments must be refer	red to under item 1 and annexed to this		
6.	Add	additional observations, if necessary:						
III.	No	n-establishment of opinion w	ith re	gard to nove	elty, inventive step	and industrial applicability		
1.	The obv	ne questions whether the claimed invention appears to be novel, to involve an inventive step (to be non- evious), or to be industrially applicable have not been examined in respect of:						
		the entire international applica	ation,					
	$\boxtimes$	claims Nos. 4						
		because:						
		the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):						
	$\boxtimes$	the description, claims or drawings (indicate particular elements below) or said claims Nos. 4 are so unclear that no meaningful opinion could be formed (specify):						
		see separate sheet						
		the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.						
		no international search report	has b	een establish	ed for the said claim	ns Nos.		
2.	or a	meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative instructions:						
	☐ the written form has not been furnished or does not comply with the Standard.							
		the computer readable form h	as not	been furnish	ed or does not com	oly with the Standard.		
٧.	Rea cita	soned statement under Artic tions and explanations supp	ele 35( orting	2) with rega such stater	rd to novelty, inver nent	ntive step or industrial applicability;		
1.	Stat	ement " " " " " " " " " " " " " " " " " " "	. ۔. م			the company of		
	Nov	elty (N)	Yes: No:	Claims Claims	1 to 3			
	Inve	ntive step (IS)	Yes: No:	Claims Claims	1 to 3			
	Indu	strial applicability (IA)	Yes: No:	Claims Claims	1 to 3			

2. Citations and explanations

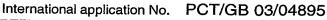
# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

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see separate sheet



**EXAMINATION REPORT - SEPARATE SHEET** 

Re Item III: Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

No examination of the claimed invention as to novelty, inventive step and industrial applicability is carried out for claim 4 because claim 4 relies on references to the drawings (see Rule 6.2(a) PCT and the PCT Preliminary Examination Guidelines, PCT/GL/IV, Chapter II, 4.10).

Re Item V: Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement.

#### 1. Technical Field:

Method of calibrating bias drift with temperature over an operating temperature of a vibrating structure gyroscope.

### 2. State of the Art:

The following documents have been considered for the purposes of this report:

D1: S. K. Hong: "Compensation of nonlinear thermal bias drift of Resonant Rate Sensor using fuzzy logic"; Sensors and Actuators A, Elsevier Sequoia S.A.; vol. 78, no. 2-3; 14 December 1999

D2: GB-A-2 327 265; British Aerospace PLC; 20 January 1999

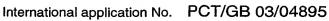
Document D1, which is considered as being the closest prior art to the subject-matter of independent claim 1, describes the compensation of nonlinear thermal bias drift of resonant rate sensors by using fuzzy logic. Document D2 discloses a method for reducing bias error in a vibrating structure gyroscope.

3. Independent Claims: Claim 1 (apparatus).

# 4. Novelty and Inventive Step - Articles 33(2) and (3) PCT

## 4.1 Independent claim 1:

The subject-matter of independent claim 1 differs from document D1 in that a response mode signal is separated into a real component induced by applied rotation



**EXAMINATION REPORT - SEPARATE SHEET** 

and a quadrature component which is an error term. Primary drive means voltage which corresponds to a change in quality factor, vibrating structure frequency, secondary drive quadrature component values which correspond to real component bias errors and secondary drive real component values which correspond to a change in bias are measured to calculate a set of bias calibration coefficients.

By using this calculated set of bias calibration coefficients, the objective technical problem is solved to improve the performance of the bias drift over temperature. Such a calculation is not known nor rendered obvious by the cited prior art. Hence, the subject-matter of present claim 1 is considered as being novel and inventive. The requirements of Article 33(2) and (3) PCT are fulfilled.

# 4.2 Dependent Claims 2 and 3:

The dependent claims 2 and 3 relate to preferred embodiments of the apparatus according to independent claim 1. Therefore, the requirements of Article 33(2) and (3) PCT are also fulfilled.

### 5. Industrial Applicability - Article 33(4) PCT

The invention as claimed in claims 1 to 3 is industrially applicable in the field of calibrating bias drift with temperature of vibrating structure gyroscopes.

### Certain defects in the international application 6.

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in document D1 is not mentioned in the description, nor is this document identified therein.